GRAFLEX "22"

GRAFLEX, INC.
Rochester 8, New York

192-155

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1. Introduction

This section of the Service Parts Manual covers the Graflex "22". The text and illustrations cover disassembly, cleaning, reassembly, troubles and lubrication. The parts list indexes to the accompanying illustrations. Always refer to parts by the part number and name, never by the index number in correspondence and orders.

The Graflex "22" is a twin lens reflex, using 120 film, taking a picture 2-1/4 inches square - 12 pictures to the roll of film. The Model 200 is equipped with the Century synchro X-F-M self setting shutter; the Model 400 with the Graphex synchro X-F-M set and release shutter and the Model 400F with the Graphex synchro X. Color coded markings indicate the proper setting with any type flash lamp. The sharp, f/3.5 lens is color corrected, hard coated, and has a 85mm focal length, ensuring critical sharpness even in the corners of the picture. It is matched in focal length to the viewing lens for accuracy in focusing.

2. Inspection and Troubles

Table I of potential troubles, causes, and remedies is supplied so that difficulties may be promptly recognized and proper steps taken to overcome them. Before disassembly check for loose or missing screws and sliding surfaces that are binding because of lack of lubrication.

3. Basic Camera Disassembly

A. Remove hood assembly (1-2) by removing four screws (1-1).
B. If necessary, remove the fresnel field lens (1-4) and the ground glass (1-5) by removing two springs (1-3).
C. If necessary, remove back (1-7) by removing pin (1-6) from case assembly (1-8).

4. Focusing Hood Disassembly

A. Drill out rivet (2-1).
B. Remove cover (2-3), springs (2-4) and door assembly (2-5) by removing shaft (2-2).
C. If necessary, remove covering (2-6) from door assembly (2-5).
D. If necessary, remove plate (2-8), magnifier(2-9) and spring (2-10) by drilling out two rivets (2-7).
E. Remove hood (2-12) by removing pin (2-11).
F. Remove hood erection button as follows:
   (1) On old cameras remove lever (2-14) by removing rivet (2-13) from frame assembly.
   (2) On newer cameras remove hood erecting button (2-15) from frame assembly (2-16).

5. Back Cover Disassembly

A. Remove covering (3-1) from back cover (3-24).
B. Remove film pressure plate (3-3) by drilling out two rivets (3-2).
C. Remove film straightener (3-5) by drilling out two rivets (3-4).

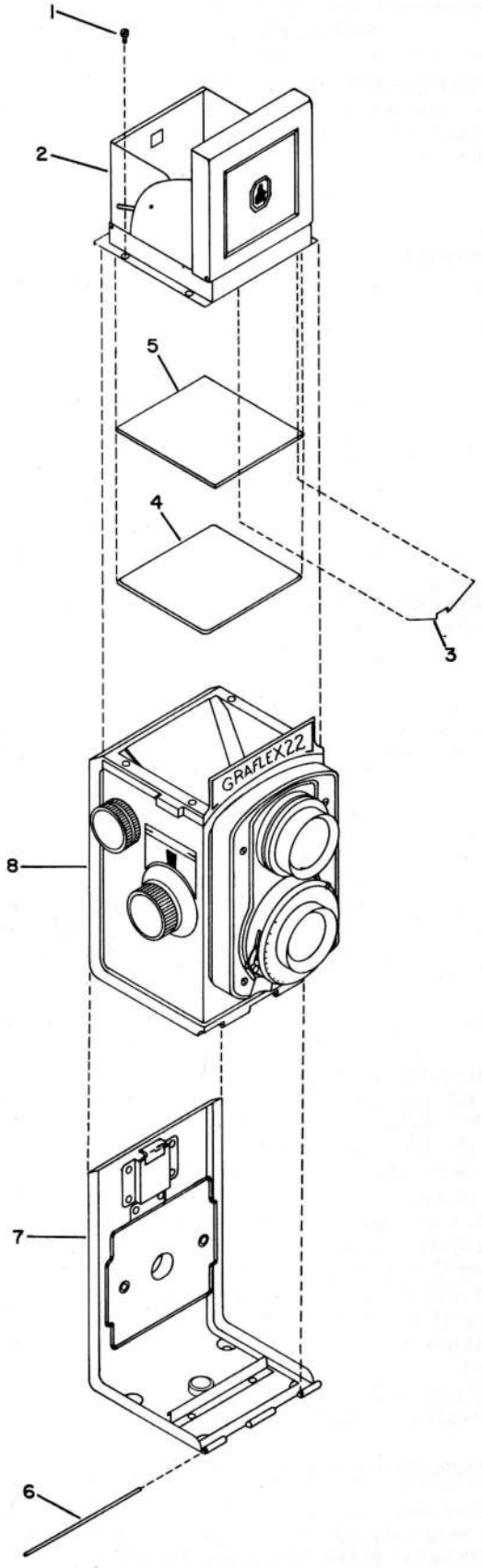


Figure 1. Basic Camera

Table I. Troubles, Causes and Remedies

TROUBLES	CAUSES	REMEDY
No spring action to back latch	Back latch spring (3-17) broken	Replace spring
Excessive backlash in focusing knob	Lack of spring pressure on ball (6-3)	Tighten screw (6-5)
	Screw (6-1) loose	Tighten screw
Focusing knob binds	Excessive spring pressure on ball (6-3)	Loosen screw (6-5)
	Cam follower (6-7) rubbing against face of cam assembly (6-12)	Screw follower into focusing shaft (6-9)
	Rough shaft on cam (6-12)	Replace cam
	Rough focusing shaft assembly (6-6) or defective focusing bracket (6-11)	Replace defective part
	Guide pin of front plate assembly (4-12) rubs on case assembly	Check alignment of plate assembly (4-12) and case assembly
Winding knob rotates in either direction	Spring (5-6) broken or has become unstaked	Restake or replace winding knob assembly - See paragraph 10-I. NOTE: Action of spring must limit counter clockwise movement of film transport knob to a maximum of 15°.
Pictures out of focus	Taking lens out of synchronization with viewing lens	Realign lens - See paragraph 12-J
	Plate assembly (4-12) out of alignment	Plate assembly must be aligned within ± .002" of plane of focal plane partition
	Shell (4-2) hits front surface of case assembly (4-23) when lens is in infinity position, thus throwing lens out of line	Add washers (4-4) between front shell (4-2) and plate assembly (4-12)

D. Remove tripod socket as follows:
(1) On older cameras remove tripod socket (3-8) by removing pin (3-6) and nut (3-7).
(2) On newer cameras care must be used when removing tripod socket (3-9) which is spun in place.

E. Remove winding window assembly consisting of plate (3-11), window (3-12), slide assembly (3-13) and spring (3-14) by drilling out six rivets (3-10).

F. Remove door latch housing (3-16) and door latch spring (3-17) by removing four rivets (3-15).

G. Remove door latch (3-19) by drilling out button (3-18).

H. If necessary, remove light seals (3-20, 3-21, 3-22 and 3-23) from back cover (3-24).

6. Front Standard Disassembly

A. Unsolder, from the interior contacts of clip on case assembly, the two wires from shutter (4-8).

B. Remove shutter (4-8) and shim (4-9), if used, by removing shutter jamb nut (4-7).

NOTE: This applies to models 200 and 400 only. When disassembling model 400F the front shell assembly (4-2) must be removed before the shutter.

C. If necessary, remove covering (4-3) from shell assembly (4-2).

D. Remove spacer shims (4-4) if they were used.

E. Remove viewing lens (4-5) and viewing lens lock nut (4-6).

F. On model 400F, remove shutter (4-8) and shim (4-9), is used, by removing shutter jamb nut (4-7).

G. Remove panel (4-10).

H. Remove front plate assembly (4-12) and shim washers (4-13 and 4-14), if used, by removing nut (4-11).

I. Remove inner shell (4-16) and light seal assembly (4-18) by removing four screws (4-15).

J. If necessary, remove light seal (4-17) from inner panel (4-16).

K. If necessary, remove felt seal (4-19) from ring (4-20).

L. If necessary, remove mirror (4-21) from case assembly (4-23).

M. Remove mirror cushion (4-22) and old EC-524 cement with Petroleum Naptha or toluol.

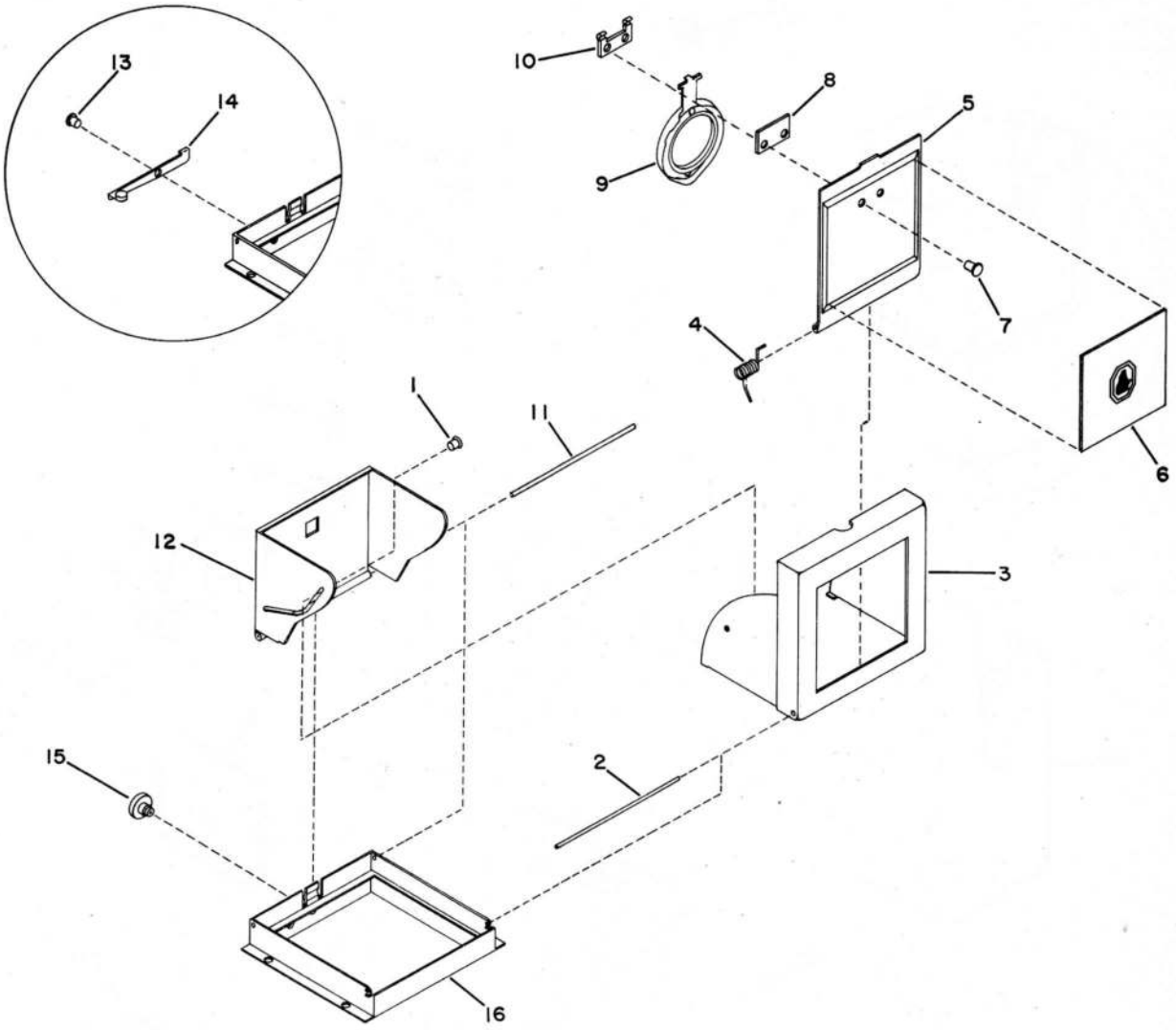


Figure 2. Focusing Hood

7. Case Disassembly

A. Remove focusing knob (5-2) by removing groove pin (5-1).
B. If necessary, remove covering (5-3) from focusing knob (5-2).
C. Remove winding knob (5-7) by removing retaining ring (5-4), washer (5-5) and winding knob spring (5-6).
D. If necessary, remove covering (5-8) from winding knob (5-7).
E. Remove focusing depth of field plate (5-10) by removing two screws (5-9).
F. Remove film spool retaining shaft (5-14), spring (5-13), and ball (5-12) by removing retaining ring (5-11).
G. Remove clip (5-20), contacts (5-18 and 5-21) and washers (5-16 and 5-17) by removing rivets (5-15 and 5-19).
H. Remove covering (5-22).
I. Remove focal plane frame (5-24) by removing four rivets (5-23).
J. If necessary, remove film rollers (5-25) from focal plane frame (5-24).
K. If necessary, remove film spool tension springs (5-27) from case assembly (5-28) by removing two rivets (5-26).

8. Focusing Mechanism Disassembly

A. Remove focusing housing assembly (6-2) by removing screw (6-1).
B. Remove ball (6-3), spring (6-4) and screw (6-5) from housing assembly (6-2).
C. Remove focusing shaft (6-6) from focusing bracket (6-11).
D. On older cameras cam follower (6-7) and set screw (6-8) may be removed from focusing shaft (6-9).
E. Remove focusing bracket (6-11) from case assembly by removing four screws (6-10).
F. Remove cam (6-12) from case assembly (6-13).

9. Cleaning

After disassembly, thoroughly clean all parts using trichlorethylene to remove all old lubricants and toluol to remove old EC-880 cement.

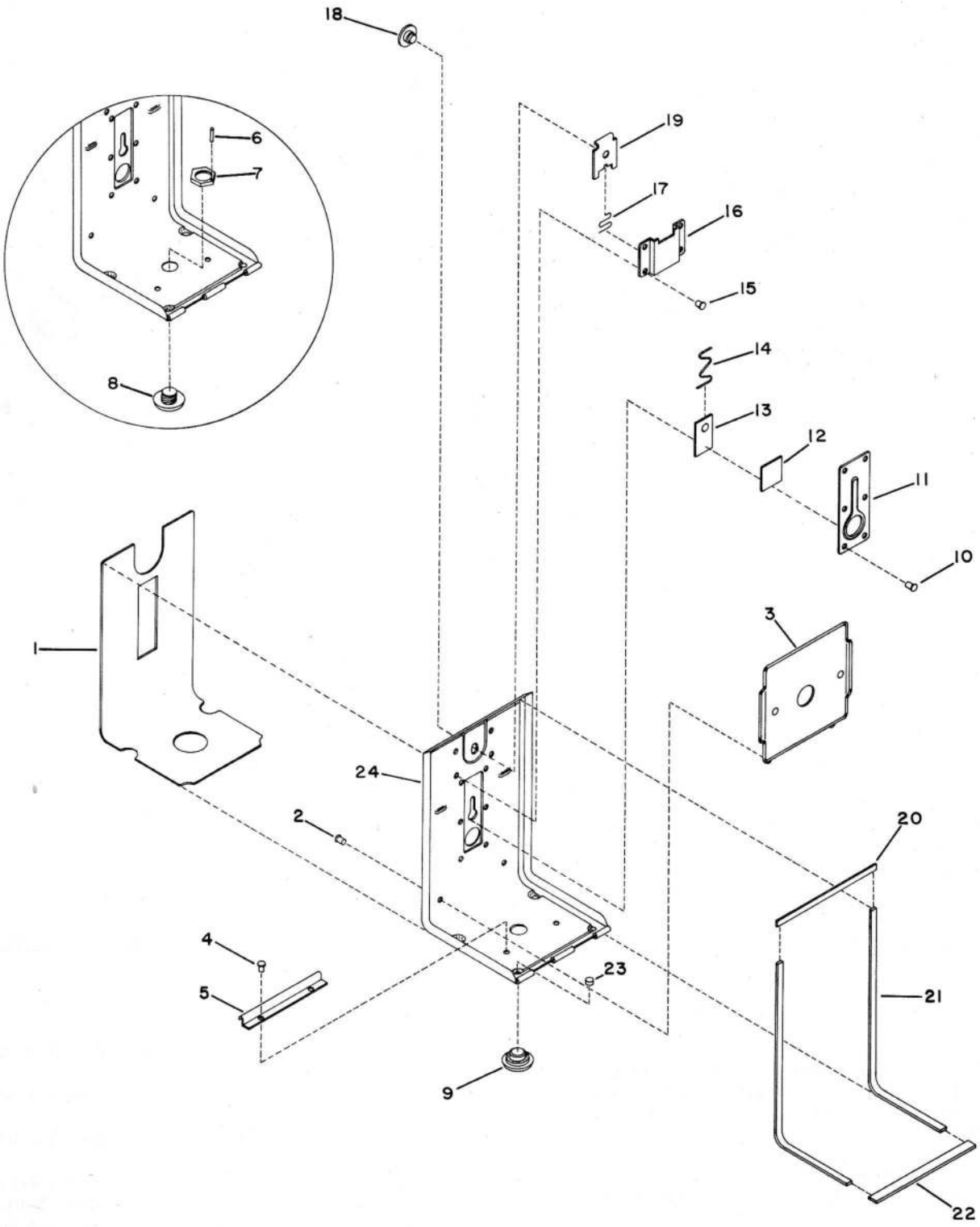


Figure 3. Back Cover

10. Body Reassembly

A. Assemble film spool tension springs (5-27) to case assembly (5-28) with two rivets (5-26).
B. Assemble film rollers (5-25) to focal plane frame (5-24).
C. Assemble focal plane frame (5-24) to case assembly (5-28) with four rivets (5-23).
D. Assemble covering (5-22) to case assembly (5-28). Before cementing covering to case assembly, remove all old covering and any old cement with toluol. Assemble covering to case assembly a section at a time,

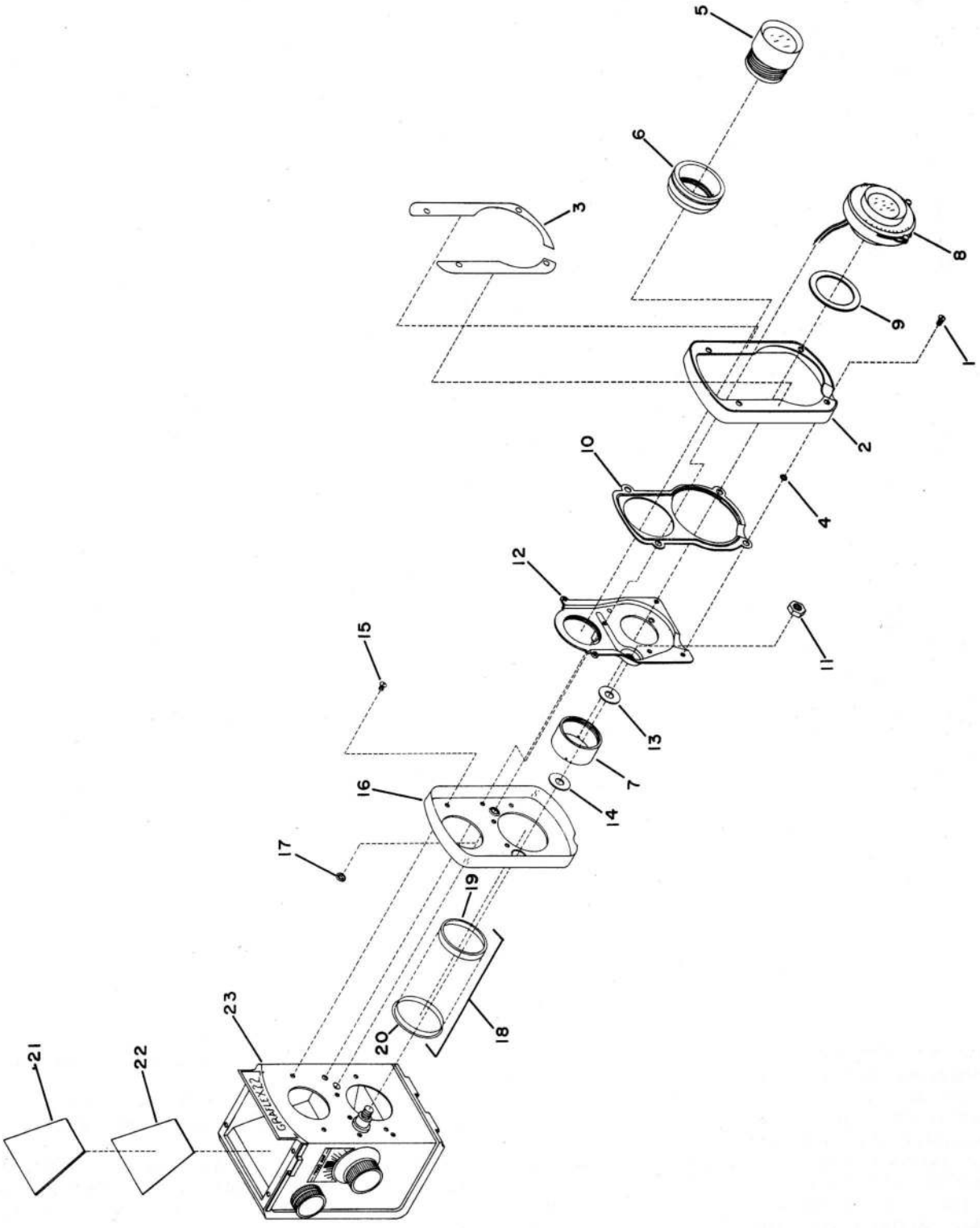


Figure 4. Front Standard

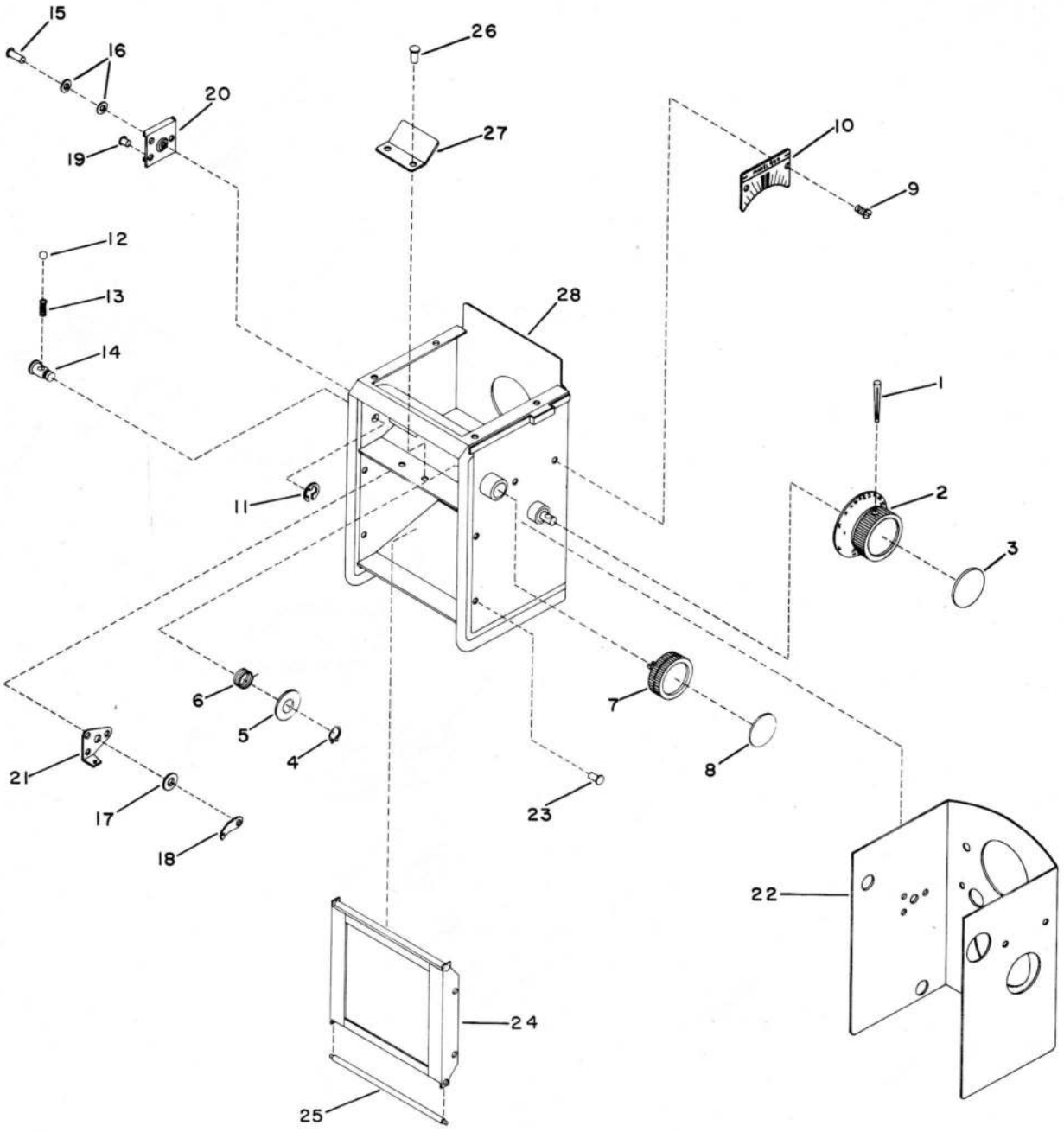


Figure 5. Case Assembly

starting with the side with the flash gun clip. The covering is pre-coated with a cement which only needs to be activated with toluol. Allow the toluol to evaporate sufficiently so that the cement coating is tacky. Press in place on the flash gun clip side of the camera and rub firmly with fingers until cement adheres. Be especially careful that the covering is cemented firmly in place around the two film spool shaft support bushings. Activate the cement on the section of the covering for the front of the camera and press firmly in place across the front. Be careful that the covering fits flush against the name plate or slightly under it. Activate the cement for the remaining portion of the covering and press it firmly in place on the winding knob side of the camera. If any portions of the covering does not adhere firmly to the case assembly recement, using EC-880.

E. Assemble flash gun clip (5-20), contacts (5-18 and 5-21) and washers (5-17 and 5-16) with three rivets 5-19) and rivet (5-15).

F. Assemble spring (5-13) and ball (5-12) to film spool retaining shaft (5-14) then assemble shaft to case assembly and retain in place with retaining ring (5-11).

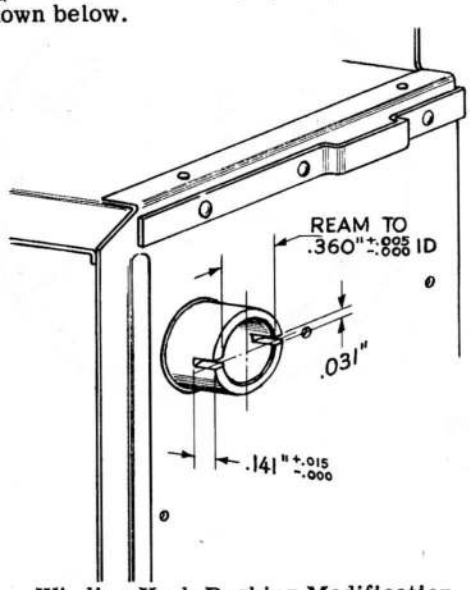
G. Assemble depth of field plate (5-10) to case assembly with two screws (5-9).

H. Activate pre-coated cement on covering (5-8) and assemble to winding knob (5-7). See paragraph 10-D.

I. Assemble winding knob spring (5-6) to bushing of case assembly with tail of spring in slot of bushing

and stake in place.

NOTE: To replace winding knob on older cameras, it is necessary to rework the winding knob bushing of case assembly (5-28) to the dimensions shown below.



Winding Knob Bushing Modification

J. Insert winding knob assembly (5-7), with tail of spring in slot of bushing, replace washer (5-5) and retaining ring (5-4).

K. Activate cement on pre-coated covering (5-3) with toluol and cement to focusing knob (5-2). See paragraph 10-D.

L. Assemble focusing knob (5-2) to cam shaft (6-12) with groove pin (5-1). If new cam assembly (6-12) or focusing knob (5-2) are to be installed, drill a .0635" diameter hole in cam shaft using focusing knob (5-2) as drill guide. After drilling, cam assembly (6-12), focusing knob (5-2) and case assembly (5-28) are matched and should be kept in a set.

M. Assemble focusing knob and drive groove pin in to approximately sub-flush on both sides after the assembly of paragraph 11-A.

11. Focusing Mechanism Reassembly

A. Assemble cam (6-12) to case assembly (6-13). See paragraph 10-L for matching cam, case and focusing knob.

B. Assemble focusing bracket (6-11) to case assembly (6-13) with four screws (6-10).

C. Assemble cam follower (6-7) and cam follower set screw (6-8) to focusing shaft assembly (6-9). Lubricate shaft with #20 grease or Unitemp before assembly. With focusing shaft assembly (6-6) assembled to camera with follower in a visually horizontal position follower is to contact cam surface on long throw end of cam with the lens at the infinity position. Add washer shims (4-13 and 4-14) as required to attain this condition. Adjust follower so that it contacts as much of cam surface as possible without end of follower rubbing on cam face, then lock in place with set screw.

NOTE: On later cameras the cam follower is permanently assembled to the focusing shaft.

D. Assemble ball (6-3) and spring (6-4) with screw (6-5) to housing assembly (6-2). Lubricate spring and ball with #20 grease or Unitemp before assembling. A liberal amount of grease will cause ball (6-3) to adhere to housing assembly making it easy to assemble into camera.

E. Assemble housing assembly (6-2) to focusing shaft assembly (6-6) with screw (6-1).

F. Lubricate working surfaces of focusing shaft assembly (6-6), follower (6-7) and cam surfaces (6-12) with #20 shutter grease or Unitemp. Do not apply excessive amount.

12. Front standard Reassembly

A. Cement mirror cushion (4-22) to case assembly (4-23) with EC-524 cement. When cementing, coat case assembly (4-23) with EC-524 cement and let dry tack free, then coat mirror cushion (4-22) and let dry until quite sticky. Join the mirror cushion to the case assembly and press firmly in place.

B. Cement mirror (4-21) to cemented mirror cushion (4-22) with EC-524 cement in the same manner as mirror cushion.

C. Cement new velvet seal (4-19) to ring (4-20) with EC-880 cement. Velvet side of the seal should be out, rim of seal is to be flush with flange surface of ring all around.

D. Cement new light seal (4-17) to inner panel (4-16) with EC-880 cement.

E. Assemble light seal assembly (4-18) to inner shell (4-16) and assemble shell to case assembly with four screws (4-15).

F. Assemble front plate assembly (4-12) with shim washers (4-13 and 4-14) as required in paragraph 11-C with hex nut (4-11). Plate assembly must align within ± .002" with plane of focal plane frame (5-25). Lubricate working surfaces of front plate assembly guide rod with #20 shutter grease. Do not use an excessive amount.

NOTE: When assembling plate assembly (4-12) to focusing shaft, the focusing case assembly (6-2) should be in a visual horizontal position. A deviation from the horizontal position of (6-2) may or may not cause the focusing mechanism of the camera to work hard. If the mechanism works hard or binds with (6-2) in horizontal position it may be necessary to throw it off the horizontal slightly for easy operation of the focusing mechanism. Before moving focusing case assembly off the horizontal position to ease operation of the focusing mechanism the set screw (6-5) should be adjusted for smooth operation of the cam.

G. Assembly panel (4-10) to front plate assembly (4-12).

H. Assemble shutter (4-8) with shim (4-9), if used, with shutter jamb nut (4-7). With front plate assembly (4-12) in rear-most position, measure from taking lens seat on lens plate to focal plane. Match taking lens focal length to this dimension to within .010 inches. Add shims (4-9) as required to bring taking lens into focus at infinity. Match viewing lens (4-5) focal length to taking lens within .010 inches.

NOTES:

1. The front shell (4-2) must be assembled before taking lens (4-8) when assembling the Model 400F.
2. It is recommended that the camera be returned to Graflex Sales Service Department if viewing or taking lens must be replaced.

I. Wiring Instructions:

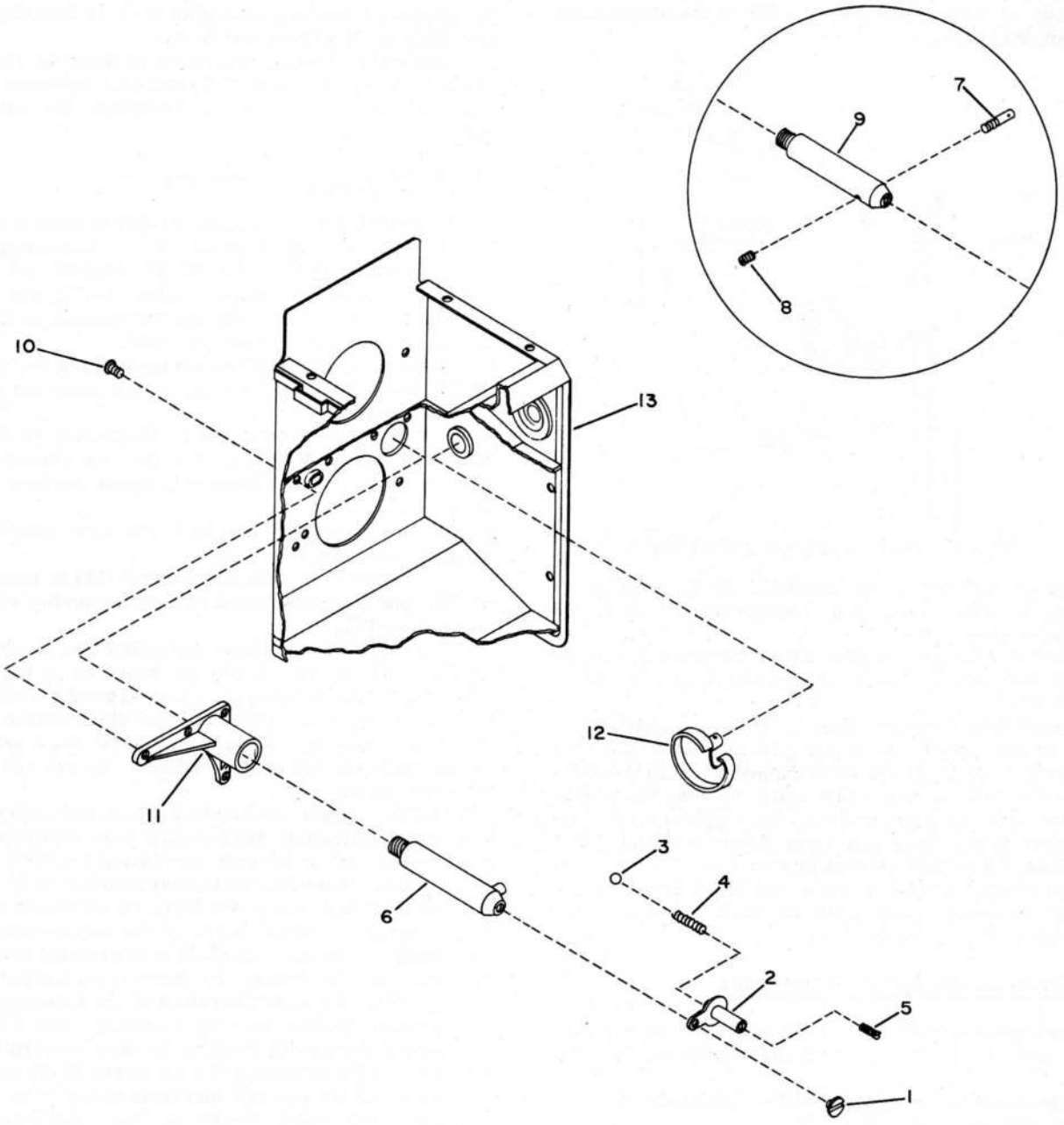


Figure 6. Focusing Mechanism

(1) Models 200 and 400.
Thread wires from shutter (4-8) through holes in front plate assembly (4-12). inner shell (4-16), and case assembly (4-23). Using rosin core solder, solder black wire from shutter to contact "A" (5-21) and other wire (color other than black) to contact "B" (5-18).
(2) Model 400F.
Using rosin core solder, solder one wire from shutter (4-8) to contact "A" (5-21) and the other wire to contact "B" (5-18).

J. Assemble viewing lens (4-5) and viewing lens lock nut (4-6) to front plate assembly (4-12). Focus taking lens at 4 or 6 feet then focus viewing lens at the same distance and lock viewing lens in place with nut (4-6). Set dial on focusing knob (5-2) by racking lens back to infinity position and turning dial by means of knob wrench T-H34130-T. Refocus on 4 or 6 feet and check calibration of dial against index mark on depth of field plate (5-10).

K. Cement covering (4-3) to shell assembly (4-2), by activating the pre-coated cement on the back of the covering with Toluol, let dry until tacky, and press into position on shell assembly for approximately 1 minute or until covering adheres firmly.

L. Assemble spacer shims (4-4), if they were used, and shell assembly (4-2) to front plate assembly with four screws (4-1).

13. Back Cover Reassembly

A. Cement light seals (3-20, 3-21, 3-22 and 3-23) to back cover (3-24) with EC-880 cement.
B. Assemble door latch (3-19) to back cover (3-24) with button (3-18).
C. Lubricate door latch (3-19) with Dixon's #3 Graphite grease before assembly. Do not use excessive amount. Parts must move freely and be returned completely by spring (3-17).
D. Assemble door latch spring (3-17) and door latch housing (3-16) to back cover with four rivets (3-15).
E. Cement window (3-12) to window housing (3-11) with EC-776 cement. Household cement or shellac may also be used.
F. Assemble slide assembly (3-13) and spring (3-14) to back cover (3-24) with window housing (3-11) and hold in place with six rivets (3-10).
G. After assembly, slide assembly (3-13) must move freely and smoothly when button is pushed upward, and be returned completely by spring (3-14).
H. If a tripod socket of the older type (3-8) must be replaced, proceed as follows:
(1) Enlarge hole for tripod socket in back cover to .486" diameter.
(2) File four equally spaced notches in hole so new tripod socket will have a firm grip on back cover.
(3) Assemble new tripod socket (3-9) to back cover and rivet in place.
I. Assemble film straightener (3-5) to back cover (3-24) with rivets (3-4).
J. Assemble film pressure plate (3-3) to back cover (3-24) with two rivets (3-2).
K. Reactivate cement on covering (3-1) and cement to back cover (3-24). See paragraph 10-D.

14. Focusing Hood Reassembly

A. Assemble hood erecting button or lever as follows:
(1) Assemble hood erecting lever (2-14) to frame assembly (2-16) with rivet (2-13).
(2) Assemble hood erecting button (2-15) directly to frame assembly (2-16).
B. Assemble hood (2-12) to frame assembly (2-16) with pin (2-11).
C. Assemble spring (2-10), magnifier assembly (2-9) and plate (2-8) to door (2-5) with two rivets (2-7).
D. Reactivate cement on covering (2-6) and cement to door (2-5). See paragraph 10-D.
E. Assemble door assembly, springs (2-4) and cover (2-3) to frame assembly (2-16) with shaft (2-2). Ground end of shaft (2-2) must be to blind end of cover (2-3).
F. Assemble rivet (2-1) through slot in hood (2-12) and through hole in cover (2-3). Hood cover must spring up freely and positively when released.

15. Basic Camera Reassembly

A. Assemble back (1-7) to camera assembly (1-8) with pin (1-6). Latch plate on the camera must be adjusted to engage the latch of the back by a minimum of 1/16th inch when cover is closed.
B. Assemble ground glass (1-5) with ground side next to grooved side of fresnel lens (1-4), and assemble these two to the hood assembly (1-2) with two springs (1-3).
C. Assemble hood assembly (1-2) to camera assembly (1-8) and retain in place with four screws (1-1). Hood must release completely and without binding when hood release button or lever is depressed.

Table II. Lubricants, Cleaning Solvents, Adhesives

Materials are specified for general reference by U. S. Government Specifications. If the recommended material cannot be located, local suppliers can advise a substitute that meets a specification number.

COMPOUND	GOVERNMENT SPECIFICATION	MANUFACTURER	USE
LUBRICANTS			
Dixon's #3 Graphite grease		Joseph Dixon Crucible Co. Jersey City, New Jersey	Back cover latch (3-19)
#20 Wollensak shutter grease	- - - - - -	Wollensak Optical Co. Rochester, New York	Cam surface (6-12), focusing shaft assembly (6-6), cam follower (6-7), ball (6-3), and spring (6-4) Guide rod of plate assembly (4-12)
or Texaco Unitemp	MIL-G-3278	Texas Company	

SOLVENTS			
Trichlorethylene (or carbon Tetra-chloride)	AN-T-37a	Eastman Kodak Company Rochester, New York Organic Chemicals Division	Cleaning metal parts of oil and grease
Toluol	TT-T-548	Eastman Kodak Company Rochester, New York Any chemical supply house	Solvent for cement EC-880 Activating pre-coated cement on covering Substitute for Petroleum Naptha
Petroleum Naptha (w/boiling point between 140° to 210°F.)	- - - - - -	Any chemical supply house	Solvent for EC-524 cement
ADHESIVES			
EC-880	MIL-C-4003	Minnesota Mining & Mfr. Co. Detroit, Michigan	Light seals on back (3-20, 21, 22, 23) inner shell (4-17) light seal assembly (4-19)
EC-524	MIL-C-5092	Minnesota Mining & Mfr. Co. Detroit, Michigan	Mirror cushion (4-22) and mir-ror (4-21) to case assembly
EC-776 (Household cement or shellac may be used)	- - - - - -	Minnesota Mining & Mfr. Co. Detroit, Michigan	Window (3-12) to window housing (3-11)

PARTS LIST

The Group Assembly Parts Lists are listed in disassembly order. The list divides the components into major assemblies, their subassemblies and parts. By the use of indented columns, the relationship of the assemblies to the subassemblies and parts is obtained.

The column titled "Figure and Index No." contains the index number in disassembly order of the items illustrated. Do not use the figure or index number in correspondence--specify the catalog or part number and name.

The column titled "Part Number" contains the Graflex part and drawing number, or the catalog number of the item listed.

The column titled "Nomenclature" (including numbered columns) lists item nomenclature on the Graflex drawing. In this column the relationship of the items listed to the final assembly is indicated. If the nomenclature begins in the column marked "4", this item will be a component of the first assembly above which precedes it in column marked "3". The assembly in the column marked "3" will be a component of the first assembly which preceded it in the column marked "2" etc.

The column titled "Units per Assy." lists the quantity required at that assembly - it is not necessarily the total. When the quantity figure is omitted, the code "AR" or "NP" will appear. The code "AR" is used for bulk items when an indefinite amount may or may not be used "as required". The code "NP" is used for items that are part of a riveted assembly and the next higher assembly should be ordered as these parts are "not procurable".

The columns titled "Cost" is subdivided "Net" and "List". The prices listed are for one item, not the quantity listed in the preceding column. When the price is omitted the code "NP" will indicate that this part is "not procurable" and that the next higher assembly should be ordered.

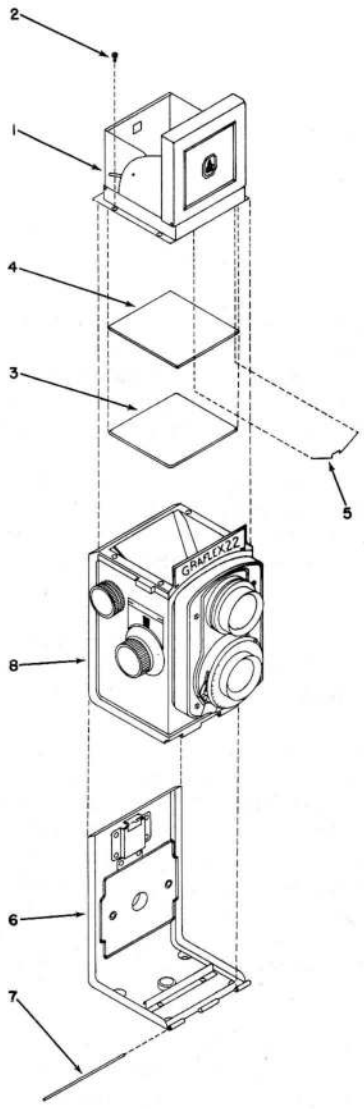


Figure 1. Camera Assembly Complete

Figure and Index No.	Part Number	1 2 3 4 5 Nomenclature	Qty	List Price
	Cat. #CL-8160	Camera Complete - Model 200 - Grey		See Price List
	Cat. #CL-8161	Camera Complete - Model 400 - Grey		See Price List
	Cat. #CL-8162	Camera Complete - Model 400F - Grey		See Price List
	Cat. #CL-8163	Camera Complete - Model 200 - Black		See Price List
	Cat. #CL-8164	Camera Complete - Model 400 - Black		See Price List
	Cat. #CL-8165	Camera Complete - Model 400F - Black		See Price List
		CAMERA ASSEMBLY COMPLETE		
1-	34130	Camera Assembly	Ref	
-1	34064-G1	. Hood Assembly (No Ektalite, Ground Glass, or Covering) . . .	1	8.85
	Attaching Part			
-2	34105	. Screw	4	.01
	---***---			
-3	34113	. Field Lens - Ektalite	1	.75

DO NOT ORDER PARTS BY FIGURE INDEX NUMBER. SPECIFY CATALOG OR PART NUMBER AND NAME.
State Quantity. Prices subject to change without notice.
NP - Non Procurable
AR - As Required

Figure and Index No.	Part Number	Nomenclature 1 2 3 4 5	Qty.	List Price
1-4	34004	. Ground Glass	1	.35
	Attaching Part			
-5	34060	. Spring	2	.02
	---***---			
-6	34144-G1	. Cover Assembly - Back	1	6.00
	Attaching Part			
-7	30172-P40	. Pin - Hinge, 0.0625 in dia, 3.031 in lg, steel, black oxide	1	.01
	---***---			
-8	No Number	. Camera Body	Ref	

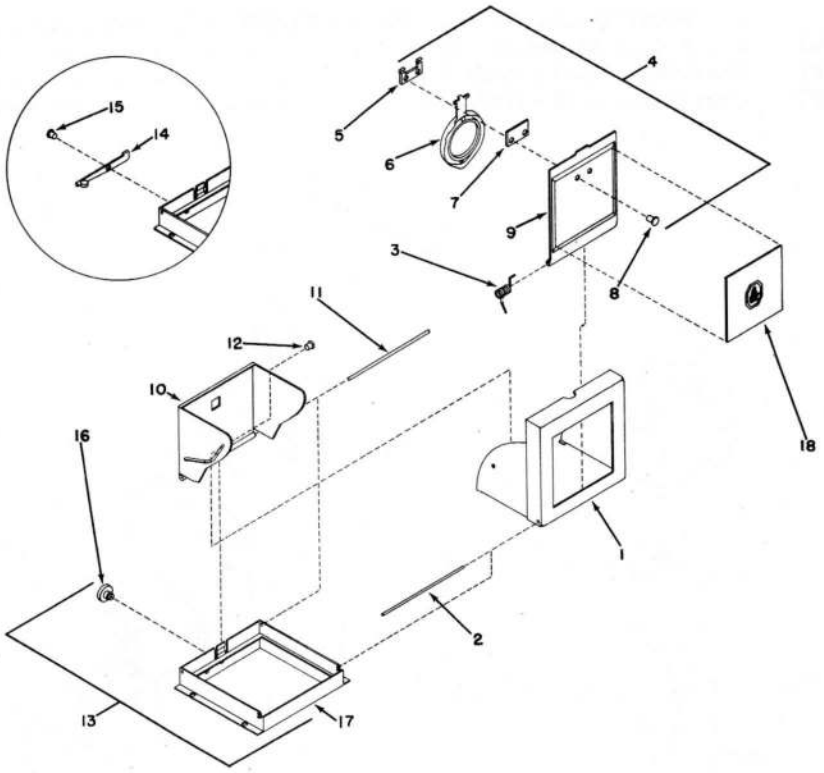


Figure 2. Hood Assembly Complete

HOOD ASSEMBLY COMPLETE

2-	34064-G1	Hood Assembly (No Ektalite, Ground Glass, or Covering)	Ref	See Index 1-1
-1	34058-G1	. Cover Assembly - Hood	1	2.00
	Attaching Part			
-2	34006	. Pin - Hinge	1	.08
	---***---			
-3	34010	. Spring - Right	1	.05
	34016	. Spring - Left	1	.05
-4	34127-G1	. Door Assembly - Top	1	2.50
-5	34053	. . Spring	1	.01
-6	34050-G1	. . Magnifier Frame Assembly (with lens)	1	1.55
-7	34054	. . Plate	1	.05
	Attaching Part			
-8	30363-P25	. . Rivet, 0.072 in lg, 0,064 in dia, FH Brass, black nickel	2	.01

DO NOT ORDER PARTS BY FIGURE INDEX NUMBER. SPECIFY CATALOG OR PART NUMBER AND NAME.

Prices subject to change without notice.

NP - Non Procurable

AR - As Required

NHA - Next Higher Assembly

Figure and Index No.	Part Number	Nomenclature 1 2 3 4 5	Qty.	List Price
2-9	34059-P1	. . Door	1	.40
-10	34061-P1	. Hood	1	1.05
	Attaching Part			
-11	30172-P39	. Pin - Hinge, 0.0625 in dia, 2.585 in lg, steel, black oxide	1	.01
-12	34015	. Rivet	1	.02
	---***---			
-13	34142-G1	. Frame Complete - Hood	1	2.50
-14	34128-G1	. . Lever Assembly - Hood (Replaced by 34106)	Ref	See Index 2-16
	Attaching Part			
-15	34112	. . Rivet (Replaced by 34106)	Ref	See Index 2-16
	---***---			
-16	34106	. . Button (Replaces 34128-G1 and 34112)	1	.25
-17	34056-G1	. . Frame Assembly - Hood	1	1.75
-18	34109-P1	Covering - Hood - Back	1	.15
	34109-P2	Covering - Hood - Grey	1	.15

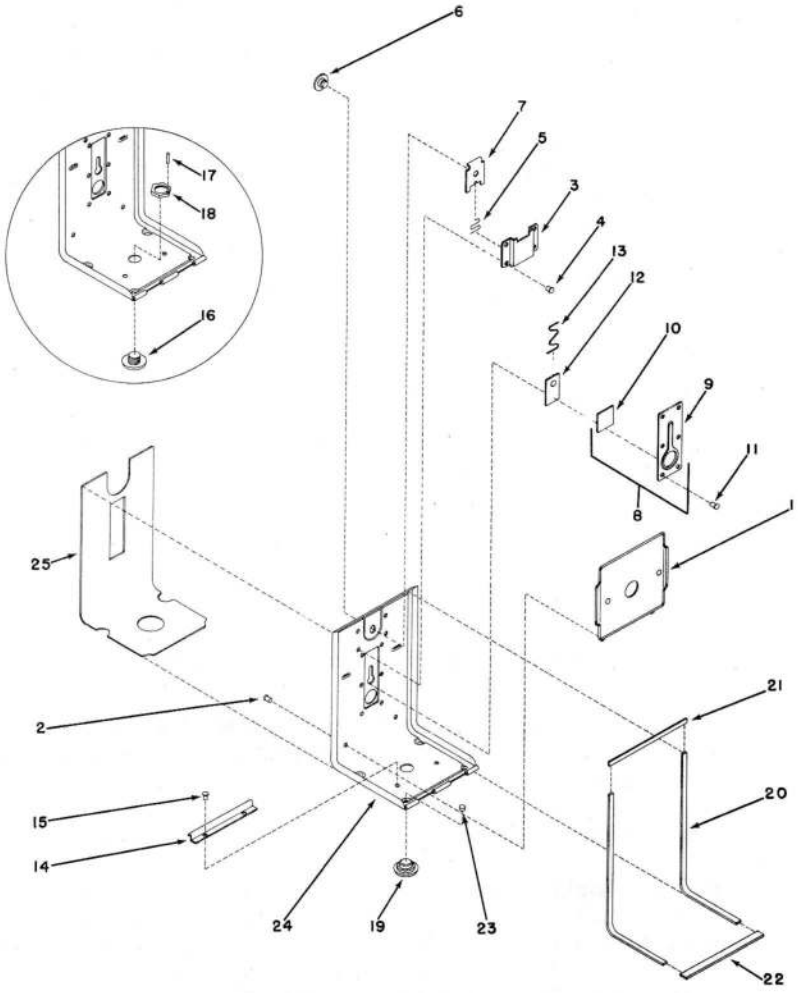


Figure 3. Back Cover Complete

BACK COVER COMPLETE

3 -	34144-G1	Cover Assembly - Back	Ref	See Index 1-6
-1	34129-G1	. Plate - Film Pressure	1	.90

DO NOT ORDER PARTS BY FIGURE INDEX NUMBER; SPECIFY CATALOG OR PART NUMBER AND NAME.
Prices subject to change without notice.

Figure and Index No.	Part Number	Nomenclature 1 2 3 4 5	Qty.	List Price
		Attaching Part		
3-2	30363-P25	. Rivet, 0.072 in lg, 0.064 in dia, FH brass, ebonol	2	.01
		---***---		
-3	34047-P1	. Housing - Latch	1	.20
		Attaching Part		
-4	30363-P24	. Rivet, 0.078 in lg, 0.057 in dia, RH brass, black nickel	4	.01
		---***---		
-5	34096	. Spring	1	.02
-6	34088	. Button - Latch	1	.20
-7	34046	. Latch	1	.20
-8	34158-G1	. Housing - Window	1	.50
-9	34152-P1	. . Housing	1	.25
-10	34154	. . Window	1	.10
		Attaching Part		
-11	30363-P24	. Rivet, 0.078 in lg, 0.057 in dia, RH brass, black nickel	6	.01
		---***---		
-12	34156-G1	. Shutter - Window with button	1	.40
-13	34151	. Spring	1	.06
-14	34045	. Straightener, Film	1	.12
		Attaching Part		
-15	30363-P24	. Rivet, 0.078 in lg, 0.057 in dia, RH brass	2	.01
		---***---		
-16	34003	. Socket - Tripod (Replaced by 34160)	Ref	See Index 3-19
		Attaching Part		
-17	34118	. Pin (Replaced by 34160)	Ref	See Index 3-19
-18	34146	. Pin - Tripod (Replaced by 34160)	Ref	See Index 3-19
		---***---		
-19	34160	. Socket - Tripod (Replaces 34003, 34146, 34118)	1	.30
-20	34100-P1	. Seal - Light, Side	2	.08
-21	34100-P2	. Seal - Light, Top	1	.08
-22	34100-P3	. Seal - Light, Bottom	1	.08
-23	34011	. Pad - Light Break	2	.02
-24	34043-P1	. Cover - Back	1	2.35
-25	34157-P1	Covering - Back Cover, Black	1	.14
	34157-P2	Covering - Back Cover, Grey	1	.14

DO NOT ORDER PARTS BY FIGURE INDEX NUMBER. SPECIFY CATALOG OR PART NUMBER AND NAME.

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NP - Non Procurable
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NHA - Next Higher Assembly

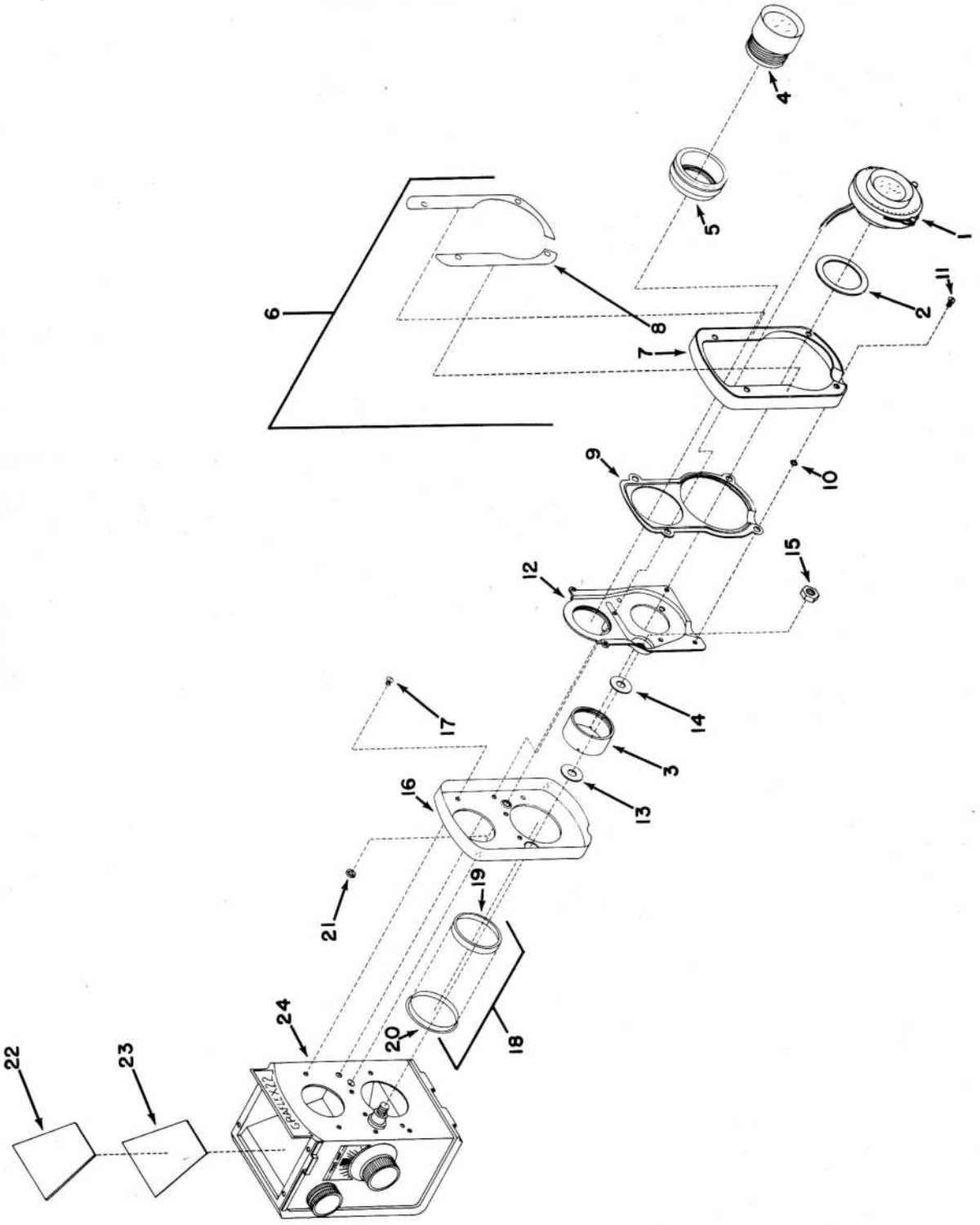

Figure 4. Front Standard Assembly

Figure and Index No.	Part Number	Nomenclature 1 2 3 4 5	Qty.	List Price
		FRONT STANDARD ASSEMBLY		
4-	No Number	Camera - Basic	Ref	
-1	Cat. #213			
	34114-P1	. Lens and Shutter - 83mm Optar, Graphex Full Sync	Ref	See Price List
	Cat. #211			
	34115-P1	. Lens and Shutter - 85mm Graftar, Century X-F-M	Ref	See Price List
	Cat. #212			
	34116-P1	. Lens and Shutter - 85mm Graftar, Graphex X-F-M	Ref	See Price List
-2	34018	. Washer - Shim	AR	.09
	Attaching Part			
-3	Wol A-6120	. Nut - Jamb (Fits all shutters mentioned above)	Ref	Part of Shutter
	---***---			
-4	Cat. #210			
	34013	. Lens - Viewing - Model 200 and 400	1	12.20
	Cat. #214			
	34014	. Lens - Viewing - Model 400F	1	16.50
	Attaching Part			
-5	34082	- Ring - Viewing Lens	1	1.25
	---***---			
-6	34091-G1	. Shell Assembly - Front, Model 200, Black	1	1.60
	34091-G2	. Shell Assembly - Front, Model 400, Black	1	1.60
	34091-G3	. Shell Assembly - Front, Model 200, Grey	1	1.60
	34091-G4	. Shell Assembly - Front, Model 400, Grey	1	1.60
	34091-G5	. Shell Assembly - Front, Model 400F, Black	1	1.60
	34091-G6	. Shell Assembly - Front, Model 400F, Grey	1	1.60
-7	34035-P2	. . Shell - Front, Model 200	1	1.25
	34035-P3	. . Shell - Front, Model 400	1	1.25
	34035-P4	. . Shell - Front, Model 400F	1	1.25
-8	34103-P1	. . Covering - Shell, Black	1	.15
	34103-P2	. . Covering - Shell, Grey	1	.15
-9	34038-P2	. Panel - Model 200	1	1.95
	34038-P3	. Panel - Model 400	1	1.95
	34038-P4	. Panel - Model 400F	1	1.95
-10	30473-P20	. Washer - Shim, 0.218 in OD, 0.089 in ID, 0.016 in thk steel	AR	.01
	Attaching Part			
-11	104-2-4	. Screw, 1/4 in lg, #2-56 OH steel, chrome	4	.03
	---***---			
-12	34065-G1	. Plate Assembly - Models 200 and 400	1	3.50
	34065-G2	. Plate Assembly - Model 400F	1	3.50
-13	30473-P68	. Washer, 0.593 in OD, 0.265 in ID, 0.032 in thk steel	AR	.01
-14	30473-P70	. Washer, 0.593 in OD, 0.265 in ID, 0.010 in thk steel	AR	.01
	Attaching Part			
-15	34139	. Nut	1	.20
	---***---			
-16	34031-P1	. Shell - Rear, Models 200 and 400	1	1.50
	34031-P2	. Shell - Rear, Model 400F	1	1.50
	Attaching Part			
-17	102-2-2	. Screw, 1/8 in lg, #2-56 RH, steel, black oxide	4	.01
	---***---			
-18	34138-G1	. Seal Assembly	1	.65
-19	34101-P1	. . Seal	NP	NHA
-20	34029	. . Ring	NP	NHA
-21	34145	. Seal - Light	1	.02
-22	34093	. Mirror	1	.75
-23	34034	. Cushion	1	.04
-24	No Number	. Case - Camera	Ref	

DO NOT ORDER PARTS BY FIGURE INDEX NUMBER. SPECIFY CATALOG OR PART NUMBER AND NAME.

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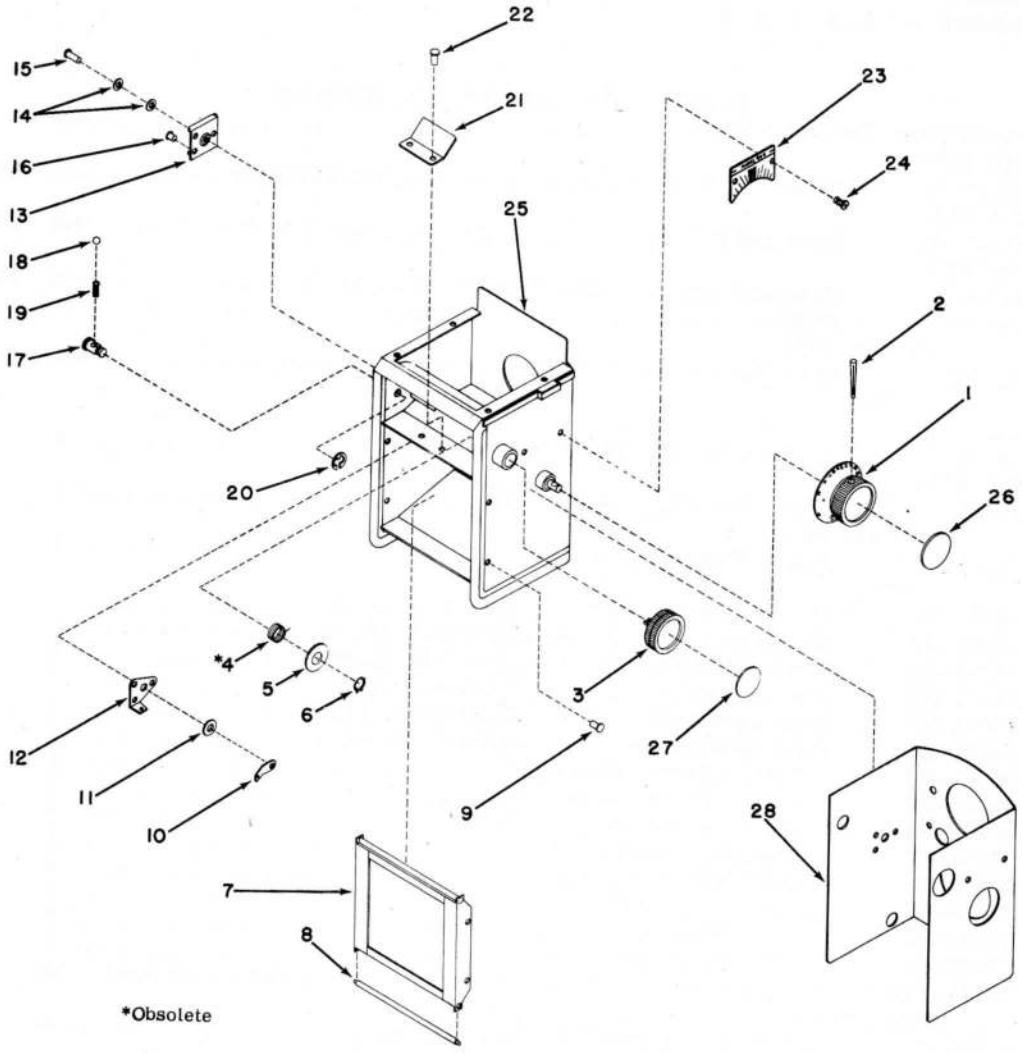

Figure 5. Case Assembly

Figure and Index No.	Part Number	Nomenclature 1 2 3 4 5	Qty.	List Price
		CASE ASSEMBLY		
5-	No Number	Case Assembly (Partial)	Ref	
-1	30474-G1	. Knob - Calibrated Focusing, 85mm Lens.	1	2.95
	30474-G2	. Knob - Calibrated Focusing, 83mm Lens.	1	2.95
		Attaching Part		
-2	180-2-14	. Pin - Groove, 0.0625 in dia to 0.068 in dia, 7/8 in lg, steel . .	1	.02
		---***---		
	34036-G1	. Knob - Winding (Replaced by 34159-G1).	Ref	See Index 5-3
-3	34159-G1	. Knob Assembly - Winding (Replaces 34036-G1, 34098).	1	.75
-4	34098	. Spring (Replaced by 34159-G1).	Ref	See Index 5-3
-5	30473-P73	. Washer, 0.625 in OD, 0.320 in ID, 0.010 in thk steel.	1	.03
		Attaching Part		
-6	30241-P14	. Ring - "C" Retaining, 0.218 in ID, 0.025 in thk steel	1	.05
		---***---		
-7	34026-P1	. Frame - Film Plane	1	.40
-8	34007	. Roller - Film.	2	.10

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AR - As Required

Figure and Index No.	Part Number	Nomenclature	Qty.	List Price
		Attaching Part		
5-9	33560-P23	. Rivet, 0.093 in lg, 0.057 in dia, FH brass, black nickel	4	.01
		---***---		
-10	34147-P1	. Contact - Center post.	1	.04
-11	33500-P38	. Washer, 0.356 in OD, 0.093 in ID, 0.062 in thk fibre.	1	.01
-12	34148-P1	. Contact - Ground.	1	.06
-13	35277-P1	. Clip - Flashgun.	1	.25
-14	30473-P81	. Washer, 0.250 in OD, 0.094 in ID, 0.020 in thk.	2	.01
		Attaching Part		
-15	30363-P42	. Rivet, 0.225 in lg, 0.090 in dia, RH brass, chrome	1	.01
-16	30363-P44	. Rivet, 0.135 in lg, 0.063 in dia, RH brass, chrome	3	.01
		---***---		
-17	34086-P5	. Shaft, Film Spool Support	2	.55
-18	30539-P6	. Ball, 0.125 in dia, steel	2	.01
-19	34000	. Spring	2	.01
		Attaching Part		
-20	30241-P10	. Ring - "C" Retaining, 0.335 in OD, 0.145 in ID, 0,025 in thk steel	2	.04
		---***---		
-21	34030	. Spring - Film Spool	2	.10
		Attaching Part		
-22	30363-P34	. Rivet, 0.062 in lg, 0.057 in dia, RH brass, ebonol	4	.01
		---***---		
-23	34104-P1	. Plate - Depth of Field - Model 200, Black.	1	.35
	34104-P2	. Plate - Depth of Field - Model 400, Black.	1	.35
	34104-P3	. Plate - Depth of Field - Model 400F, Black.	1	.35
	34104-P4	. Plate - Depth of Field - Model 200, Grey	1	.35
	34104-P5	. Plate - Depth of Field - Model 400, Grey	1	.35
	34104-P6	. Plate - Depth of Field - Model 400F, Grey	1	.35
		Attaching Part		
-24	34017	. Screw	2	.05
		---***---		
-25	No Number	. Body - Camera	Ref	
-26	34111-P2	Covering - Focusing Knob, Black	1	.08
	34111-P4	Covering - Focusing Knob, Grey	1	.08
-27	34111-P1	Covering - Winding Knob, Black.	1	.08
	34111-P3	Covering - Winding Knob, Grey	1	.08
-28	34107-P1	Covering - Body, Black	1	.29
	34107-P2	Covering - Body, Grey	1	.29

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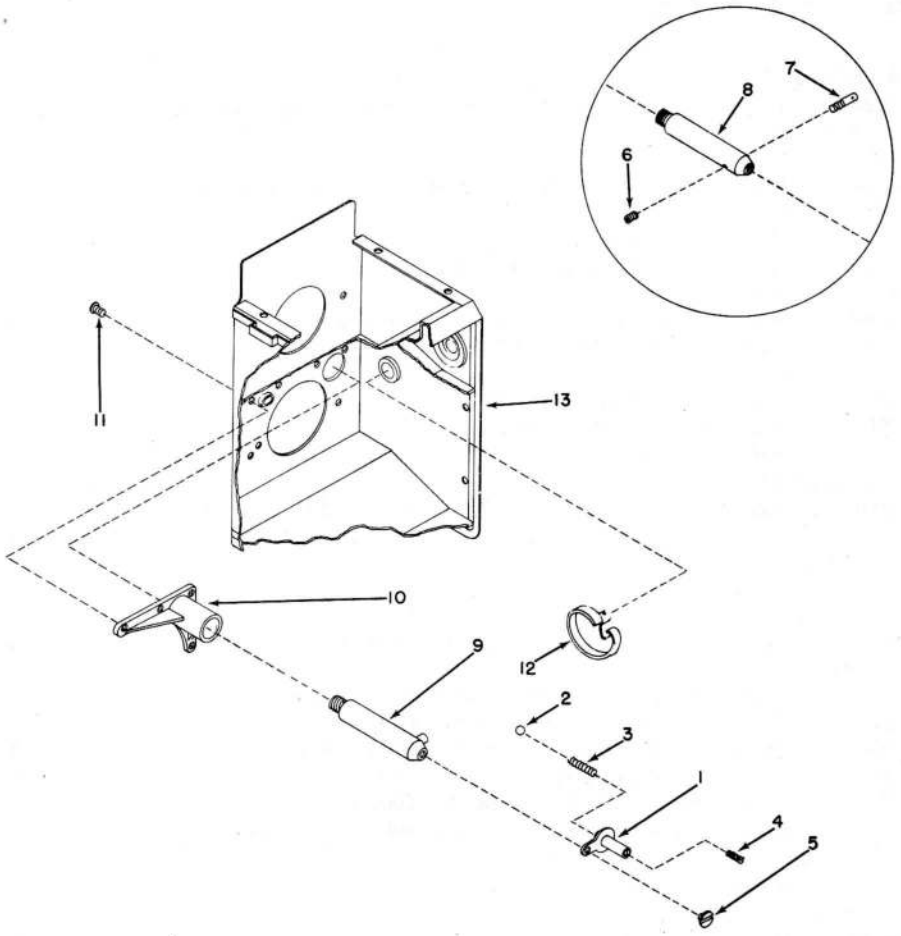

Figure 6. Focusing Mechanism

Figure and Index No.	Part Number	Nomenclature 1 2 3 4 5	Qty.	List Price
		FOCUSING MECHANISM		
6-	No Number	Case Assembly (Partial)	Ref	
-1	34137-G1	. Follower - Cam	1	.65
-2	30539-P6	. Ball, 0.125 in dia. steel	1	.01
-3	34095	. Spring	1	.01
-4	34089	. Screw - Set	1	.05
	Attaching Part			
-5	102-4-3	. Screw, 3/16 in lg, #4-40 RH steel, black oxide	1	.01
	---***---			
-6	171-4-2	. Screw - Set (Used only with 34078-P1)	1	.08
-7	34079	. Follower (Replaced by 34117-G1)	Ref	See Index 6-9
-8	34078-P1	. Rod - Focusing (Replaced by 34117-G1)	Ref	See Index 6-9
-9	34117-G1	. Rod Assembly - Focusing (Replaces 34078-P1, 34079 and 171-4-2)	1	1.00
-10	34090-P1	. Bracket - Focusing Rod	1	2.25
	Attaching Part			
-11	34017	. Screw	4	.05
	---***---			
-12	34077-G1	. Cam Assembly	1	.85
-13	No Number	. Body Camera	Ref	

DO NOT ORDER PARTS BY FIGURE INDEX NUMBERS. SPECIFY CATALOG OR PART NUMBER AND NAME.
State Quantity. Prices subject to change without notice.

Part No.	Finish	Use	Fig. Ref.	Qty.	Description	Net per 25
		Standard Screws				
102-2-2	S-7	Holds inner shell to case assy.	4-17	4	#2-56 RH 1/8" steel	.20
102-4-3	S-7	Holds focusing guide housing to focusing rod	6-5	1	#4-40 RH 3/16" steel	.20
104-2-4	P-19	Holds front shell to lens plate assy.	4-11	4	#2-56 OH 1/4" steel	.40
171-4-2	- - -	Cam follower set screw	6-6	1	#4-40 Hex socket set 1/8"	1.20
		Special Screws				
34017	- - -	Holds depth of field plate to case assy.	5-24	2		.80
	- - -	Focusing bracket retainer screw	6-11	4		.80
34089	- - -	Cam ball adjusting set screw	6-4	1		.80
34105	- - -	Holds hood assy. to case assy.	1-2	4		.20
		Nuts				
34139	- - -	Holds lens mount plate assy. to focusing rod	4-15	1		3.00
34146	- - -	Tripod socket retaining nut	3-7	1		.80
		Washers				
30473-P20	- - -	Spacer washers between front shell and front plate	4-10	AR	.218" OD, .089" ID, .016" thk steel	.20
30473-P68	- - -	Spacer washer - lens plate assy. to focusing rod	4-13	AR	.593" OD, .265" ID, .032" thk steel	.20
30473-P70	- - -	Spacer washer - lens plate assy. to focusing rod	4-14	AR	.593" OD, .265" ID, .010" thk steel	.20
30473-P73	S-7	Winding knob	5-5	1	.625" OD, .320" ID, .010" thk steel	.40
30473-P81	- - -	Flashgun shoe clip insulating washer	5-14	2	.250" OD, .094" ID, .020" thk fibre	.20
33500-P38	- - -	Flashgun shoe clip insulating washer	5-11	1	.356" OD, .093" ID, .062" thk fibre	.40
		Retaining Rings				
30241-P10	- - -	Film spool retainer shaft	5-20	2	.335" OD, .145" ID, .025" thk steel, Type 2, Waldes-Kohinoor #5133-18	.60
30241-P14	- - -	Winding knob	5-6	1	.281" ID, .025" thk steel, Type 1, Waldes-Kohinoor #5100-31	.80
		Groove Pins				
180-2-14	- - -	Holds focusing knob to cam shaft	5-2	1	.0625" dia to .068" dia, 7/8" C.D. steel	.80

Part No.	Finish	Use	Fig. Ref.	Qty.	Description	Net per 25
	Rivets					
30363-P24	P-4	Holds film straightener to back	3-15	2	RH .057" dia, .078" lg brass	.20
	P-7	Holds film winding window cover to back	3-11	6		.20
	P-7	Holds latch housing to back	3-4	4		.20
30363-P25	P-7	Focusing magnifier to top door	2-8	2	FH .064" dia, .072" lg brass	.20
	S-18	Pressure plate to back	3-2	2		.20
30363-P34	S-18	Holds film tension springs to case assy.	5-22	4	RH .057" dia, .062" lg brass	.20
30363-P42	P-22	Flashgun shoe counter contact	5-15	1	RH .090" dia, .225" lg brass	.20
30363-P44	P-22	Holds flashgun shoe to case assy.	5-16	3	RH .063" dia, .135" lg brass	.20
33560-P23	P-7	Holds film plate frame to case assy.	5-9	4	FH .057" dia, .093" lg brass	.20
34015	- - -	Holds hood and cover together	2-12	1		.40

FINISH CODE

P-7 . . . . . Black Nickel

P-19 . . . . Chromium Plate

P-22 . . . . Chromium Plate

S-7 . . . . . Black Oxide

S-18 . . . . Ebonol C